

=> d his ful

(FILE 'HOME' ENTERED AT 13:10:14 ON 06 OCT 2009)

FILE 'HCAPLUS' ENTERED AT 13:11:09 ON 06 OCT 2009

L1 1 SEA SPE=ON ABB=ON PLU=ON US20060251952/PN
 D L1 ALL
 SAV L1 HAI637/A
 SEL L1 RN

FILE 'REGISTRY' ENTERED AT 13:12:34 ON 06 OCT 2009

L2 82 SEA SPE=ON ABB=ON PLU=ON (1333-74-0/BI OR 67-56-1/BI
 OR 7440-06-4/BI OR 7782-44-7/BI OR 821770-72-3/BI OR
 821770-73-4/BI OR 821770-74-5/BI OR 821770-75-6/BI OR
 821770-76-7/BI OR 821770-77-8/BI OR 821770-78-9/BI OR
 821770-79-0/BI OR 821770-80-3/BI OR 821770-81-4/BI OR
 821770-82-5/BI OR 821770-83-6/BI OR 821770-84-7/BI OR
 821770-85-8/BI OR 821770-86-9/BI OR 821770-87-0/BI OR
 821770-88-1/BI OR 821770-89-2/BI OR 821770-90-5/BI OR
 821770-91-6/BI OR 821770-92-7/BI OR 821770-93-8/BI OR
 821770-94-9/BI OR 821770-95-0/BI OR 821770-96-1/BI OR
 821770-97-2/BI OR 821770-98-3/BI OR 821770-99-4/BI OR
 821771-00-0/BI OR 821771-01-1/BI OR 821771-02-2/BI OR
 821771-03-3/BI OR 821771-04-4/BI OR 821771-05-5/BI OR
 821771-06-6/BI OR 821771-07-7/BI OR 821771-08-8/BI OR
 821771-09-9/BI OR 821771-10-2/BI OR 821771-11-3/BI OR
 821771-12-4/BI OR 821771-13-5/BI OR 821771-14-6/BI OR
 821771-15-7/BI OR 821771-16-8/BI OR 821771-17-9/BI OR
 821771-18-0/BI OR 821771-19-1/BI OR 821771-20-4/BI OR
 821771-21-5/BI OR 821771-22-6/BI OR 821771-23-7/BI OR
 821771-24-8/BI OR 821771-25-9/BI OR 821771-27-1/BI OR
 821771-28-2/BI OR 821771-29-3/BI OR 821771-30-6/BI OR
 821771-31-7/BI OR 821771-32-8/BI OR 821771-33-9/BI OR
 821771-34-0/BI OR 821771-35-1/BI OR 821771-36-2/BI OR
 821771-37-3/BI OR 821771-38-4/BI OR 821771-39-5/BI OR
 821771-40-8/BI OR 821771-41-9/BI OR 821771-42-0/BI OR
 821771-43-1/BI OR 821771-44-2/BI OR 821771-45-3/BI OR
 821771-46-4/BI OR 821771-47-5/BI OR 821771-48-6/BI OR
 821771-49-7/BI OR 821771-50-0/BI)
 SAV L2 HAI637A/A
 D SCA

L3 138209 SEA SPE=ON ABB=ON PLU=ON ?PLATINUM?/CNS
 L4 893254 SEA SPE=ON ABB=ON PLU=ON ?ALLOY?/CNS
 L5 13786 SEA SPE=ON ABB=ON PLU=ON L3 AND L4
 L6 91731 SEA SPE=ON ABB=ON PLU=ON ?ATOMIC?/CNS
 L7 4302 SEA SPE=ON ABB=ON PLU=ON L5 AND L6

L8 E ATOMIC/CN
 4302 SEA SPE=ON ABB=ON PLU=ON L5 AND ATOMIC

FILE 'ZCAPLUS' ENTERED AT 14:21:54 ON 06 OCT 2009
 L9 QUE SPE=ON ABB=ON PLU=ON ATOMIC#
 L10 QUE SPE=ON ABB=ON PLU=ON PCT# OR PERCENT?
 L11 QUE SPE=ON ABB=ON PLU=ON L9 (3W) L10
 L12 QUE SPE=ON ABB=ON PLU=ON L9 (2W) %

FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX,
 HCAPLUS' ENTERED AT 14:24:18 ON 06 OCT 2009

FILE 'ZCAPLUS' ENTERED AT 14:27:12 ON 06 OCT 2009
 L13 QUE SPE=ON ABB=ON PLU=ON 21 OR 22 OR 23 OR 24 OR 25
 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34 OR
 35 OR 36 OR 37 OR 38 OR 39 OR 40

FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX,
 HCAPLUS' ENTERED AT 14:29:12 ON 06 OCT 2009

L14 432 SEA SPE=ON ABB=ON PLU=ON L9 (3W) L10
 L15 527 SEA SPE=ON ABB=ON PLU=ON L9 (3W) L10
 L16 480 SEA SPE=ON ABB=ON PLU=ON L9 (3W) L10
 L17 690 SEA SPE=ON ABB=ON PLU=ON L9 (3W) L10
 L18 108 SEA SPE=ON ABB=ON PLU=ON L9 (3W) L10
 L19 1341 SEA SPE=ON ABB=ON PLU=ON L9 (3W) L10
 L20 972 SEA SPE=ON ABB=ON PLU=ON L9 (3W) L10
 L21 1113 SEA SPE=ON ABB=ON PLU=ON L9 (3W) L10
 L22 1830 SEA SPE=ON ABB=ON PLU=ON L9 (3W) L10
 TOTAL FOR ALL FILES
 L23 7493 SEA SPE=ON ABB=ON PLU=ON L11

L24 QUE SPE=ON ABB=ON PLU=ON 1 OR 2 OR 3 OR 4 OR 5 OR 6
 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13 OR 14 OR 15 OR 16
 OR 17 OR 18 OR 19 OR 20

FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX,
 HCAPLUS' ENTERED AT 14:31:14 ON 06 OCT 2009

L25 181 SEA SPE=ON ABB=ON PLU=ON (L24 OR L13) (4A) L14
 L26 329 SEA SPE=ON ABB=ON PLU=ON (L24 OR L13) (4A) L15
 L27 166 SEA SPE=ON ABB=ON PLU=ON (L24 OR L13) (4A) L16
 L28 378 SEA SPE=ON ABB=ON PLU=ON (L24 OR L13) (4A) L17

L29 30 SEA SPE=ON ABB=ON PLU=ON (L24 OR L13) (4A) L18
 L30 663 SEA SPE=ON ABB=ON PLU=ON (L24 OR L13) (4A) L19
 L31 452 SEA SPE=ON ABB=ON PLU=ON (L24 OR L13) (4A) L20
 L32 644 SEA SPE=ON ABB=ON PLU=ON (L24 OR L13) (4A) L21
 L33 806 SEA SPE=ON ABB=ON PLU=ON (L24 OR L13) (4A) L22
 TOTAL FOR ALL FILES
 L34 3649 SEA SPE=ON ABB=ON PLU=ON (L24 OR L13) (4A) L23
 D L34 KWIC

FILE 'ZCAPLUS' ENTERED AT 14:35:17 ON 06 OCT 2009
 L35 QUE SPE=ON ABB=ON PLU=ON PLATINUM#

FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX,
 HCAPLUS' ENTERED AT 14:35:31 ON 06 OCT 2009
 L36 0 SEA SPE=ON ABB=ON PLU=ON L25 (4A) L35
 L37 2 SEA SPE=ON ABB=ON PLU=ON L26 (4A) L35
 L38 0 SEA SPE=ON ABB=ON PLU=ON L27 (4A) L35
 L39 2 SEA SPE=ON ABB=ON PLU=ON L28 (4A) L35
 L40 0 SEA SPE=ON ABB=ON PLU=ON L29 (4A) L35
 L41 1 SEA SPE=ON ABB=ON PLU=ON L30 (4A) L35
 L42 2 SEA SPE=ON ABB=ON PLU=ON L31 (4A) L35
 L43 9 SEA SPE=ON ABB=ON PLU=ON L32 (4A) L35
 L44 8 SEA SPE=ON ABB=ON PLU=ON L33 (4A) L35
 TOTAL FOR ALL FILES
 L45 24 SEA SPE=ON ABB=ON PLU=ON L34 (4A) L35
 D L43 2-6 KWIC

FILE 'REGISTRY' ENTERED AT 14:36:56 ON 06 OCT 2009
 E PLATINUM/CN
 E PLATINUM 1-40/CN
 E PLATINUM 2-40/CN
 E PLATINUM 40/CN
 E CHROMIUM 5-25/CN
 L46 56840 SEA SPE=ON ABB=ON PLU=ON ?CHROMIUM?/CNS AND ?NICKEL?/C
 NS
 L47 148 SEA SPE=ON ABB=ON PLU=ON L46 AND L3
 D L47 1-10 CN
 L48 70 SEA SPE=ON ABB=ON PLU=ON L47 AND L6
 D L48 9-12 CN

FILE 'REGISTRY' ENTERED AT 14:43:46 ON 06 OCT 2009
 E PLATINUM 1/CN
 E BERYLLIUM 14-25/CN
 E PLATINUM 1-40/CN

FILE 'HCAPLUS' ENTERED AT 14:46:12 ON 06 OCT 2009

L49 42 SEA SPE=ON ABB=ON PLU=ON L48
L50 10606 SEA SPE=ON ABB=ON PLU=ON PLATINUM# (2W) ALLOY#
L51 8 SEA SPE=ON ABB=ON PLU=ON L49 AND L50

FILE 'REGISTRY' ENTERED AT 14:49:07 ON 06 OCT 2009
L52 538 SEA SPE=ON ABB=ON PLU=ON PT (L) CR (L) NI/ELS
L53 313 SEA SPE=ON ABB=ON PLU=ON L52 (L) 3-6/ELC.SUB
L54 11888 SEA SPE=ON ABB=ON PLU=ON ?PLATINUM ALLOY?/CNS
L55 157 SEA SPE=ON ABB=ON PLU=ON L54 AND L53
L56 26 SEA SPE=ON ABB=ON PLU=ON L55 AND L9

FILE 'HCAPLUS' ENTERED AT 14:52:12 ON 06 OCT 2009
L57 14 SEA SPE=ON ABB=ON PLU=ON L56
L58 5 SEA SPE=ON ABB=ON PLU=ON L51 NOT L57
L59 19 SEA SPE=ON ABB=ON PLU=ON L58 OR L57

FILE 'JAPIO, ENERGY, INSPEC, COMPENDEX, WPIX, HCAPLUS' ENTERED AT
15:26:49 ON 06 OCT 2009
L60 22 DUP REMOV L45 (2 DUPLICATES REMOVED)
ANSWERS '1-2' FROM FILE JAPIO
ANSWERS '3-4' FROM FILE ENERGY
ANSWER '5' FROM FILE INSPEC
ANSWER '6' FROM FILE COMPENDEX
ANSWERS '7-15' FROM FILE WPIX
ANSWERS '16-22' FROM FILE HCAPLUS

FILE 'REGISTRY' ENTERED AT 15:27:22 ON 06 OCT 2009
E PLATINUM 1/CN
E PLATINUM 2/CN

FILE 'HCAPLUS' ENTERED AT 15:29:41 ON 06 OCT 2009
L61 2969 SEA SPE=ON ABB=ON PLU=ON L35 (4W) (L24 OR L13) (4W)
L9
D L61 KWIC

FILE 'ZCAPLUS' ENTERED AT 15:31:35 ON 06 OCT 2009
L62 QUE SPE=ON ABB=ON PLU=ON CHROMIUM#
L63 QUE SPE=ON ABB=ON PLU=ON 5 OR 6 OR 7 OR 8 OR 9 OR 10
OR 11 OR 12 OR 13 OR 14 OR 15 OR 16 OR 17 OR 18 OR 19 OR
20 OR 21 OR 22 OR 23 OR 24 OR 25
L64 QUE SPE=ON ABB=ON PLU=ON L62 (4W) L63 (4W) L9

FILE 'HCAPLUS' ENTERED AT 15:34:09 ON 06 OCT 2009
L65 4901 SEA SPE=ON ABB=ON PLU=ON L62 (4W) L63 (4W) L9

L66 2412 SEA SPE=ON ABB=ON PLU=ON L35 (W) (L24 OR L13) (4W) L9

L67 3234 SEA SPE=ON ABB=ON PLU=ON L62 (W) L63 (4W) L9

L68 636 SEA SPE=ON ABB=ON PLU=ON L66 AND L67

FILE 'ZCPLUS' ENTERED AT 15:38:30 ON 06 OCT 2009

L69 QUE SPE=ON ABB=ON PLU=ON NICKEL#

L70 QUE SPE=ON ABB=ON PLU=ON 45 OR 46 OR 47 OR 48 OR 49
OR 50 OR 51 OR 52 OR 53 OR 54 OR 55 OR 56 OR 57 OR 58 OR
59 OR 60 OR 61 OR 62 OR 63 OR 64 OR 65 OR 66 OR 67 OR 68
OR 69 OR 70

L71 QUE SPE=ON ABB=ON PLU=ON L69 (W) L70 (4W) L9

FILE 'HCPLUS' ENTERED AT 15:40:04 ON 06 OCT 2009

L72 9476 SEA SPE=ON ABB=ON PLU=ON L69 (W) L70 (4W) L9
D L72 8-10 KWIC

L73 60 SEA SPE=ON ABB=ON PLU=ON L68 AND L72
D L73 9-12 KWIC

L74 1699944 SEA SPE=ON ABB=ON PLU=ON CAT# OR CATAL?

L75 0 SEA SPE=ON ABB=ON PLU=ON L73 AND L74

L76 0 SEA SPE=ON ABB=ON PLU=ON L68 AND L74

L77 0 SEA SPE=ON ABB=ON PLU=ON L59 AND L74

FILE 'ZCPLUS' ENTERED AT 15:45:28 ON 06 OCT 2009

L78 QUE SPE=ON ABB=ON PLU=ON CAT# OR CATAL?

FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX'
ENTERED AT 15:46:14 ON 06 OCT 2009
D HI

L79 0 SEA L60

L80 0 SEA SPE=ON ABB=ON PLU=ON L78 AND L79

L81 2 SEA L60

L82 0 SEA SPE=ON ABB=ON PLU=ON L78 AND L81

L83 0 SEA L60

L84 0 SEA SPE=ON ABB=ON PLU=ON L78 AND L83

L85 2 SEA L60

L86 1 SEA SPE=ON ABB=ON PLU=ON L78 AND L85

L87 0 SEA L60

L88 0 SEA SPE=ON ABB=ON PLU=ON L78 AND L87

L89 1 SEA L60
L90 1 SEA SPE=ON ABB=ON PLU=ON L78 AND L89

L91 1 SEA L60
L92 0 SEA SPE=ON ABB=ON PLU=ON L78 AND L91

L93 9 SEA L60
L94 3 SEA SPE=ON ABB=ON PLU=ON L78 AND L93
TOTAL FOR ALL FILES
L95 5 SEA SPE=ON ABB=ON PLU=ON L78 AND L60

FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX,
HCAPLUS' ENTERED AT 15:47:06 ON 06 OCT 2009

L96 0 SEA L60
L97 0 SEA SPE=ON ABB=ON PLU=ON L78 AND L96

L98 2 SEA L60
L99 0 SEA SPE=ON ABB=ON PLU=ON L78 AND L98

L100 0 SEA L60
L101 0 SEA SPE=ON ABB=ON PLU=ON L78 AND L100

L102 2 SEA L60
L103 1 SEA SPE=ON ABB=ON PLU=ON L78 AND L102

L104 0 SEA L60
L105 0 SEA SPE=ON ABB=ON PLU=ON L78 AND L104

L106 1 SEA L60
L107 1 SEA SPE=ON ABB=ON PLU=ON L78 AND L106

L108 1 SEA L60
L109 0 SEA SPE=ON ABB=ON PLU=ON L78 AND L108

L110 9 SEA L60
L111 3 SEA SPE=ON ABB=ON PLU=ON L78 AND L110

L112 7 SEA L60
L113 5 SEA SPE=ON ABB=ON PLU=ON L78 AND L112
TOTAL FOR ALL FILES
L114 10 SEA SPE=ON ABB=ON PLU=ON L78 AND L60

FILE 'ENERGY, INSPEC, WPIX, HCAPLUS' ENTERED AT 15:50:26 ON 06 OCT

2009

L115 10 DUP REMOV L114 (0 DUPLICATES REMOVED)
 ANSWER '1' FROM FILE ENERGY
 ANSWER '2' FROM FILE INSPEC
 ANSWERS '3-5' FROM FILE WPIX
 ANSWERS '6-10' FROM FILE HCAPLUS

FILE 'HCAPLUS' ENTERED AT 15:53:20 ON 06 OCT 2009

L116 14638 SEA SPE=ON ABB=ON PLU=ON L35 (4W) (L24 OR L13)
 L117 3167 SEA SPE=ON ABB=ON PLU=ON L116 (L) ATOMIC#
 D L117 9-12 KWIC
 L118 2992 SEA SPE=ON ABB=ON PLU=ON L116 (10W) ATOMIC#
 L119 498 SEA SPE=ON ABB=ON PLU=ON L117 AND L74
 D L119 5-10 KWIC
 L120 19 SEA SPE=ON ABB=ON PLU=ON L119 AND L62
 L121 71 SEA SPE=ON ABB=ON PLU=ON L119 AND L69
 L122 12 SEA SPE=ON ABB=ON PLU=ON L121 AND L62
 D L122 5-10 KWIC

FILE HOME

FILE HCAPLUS

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications. The CA Lexicon is the copyrighted intellectual property of the American Chemical Society and is provided to assist you in searching databases on STN. Any dissemination, distribution, copying, or storage of this information, without the prior written consent of CAS, is strictly prohibited.

FILE COVERS 1907 - 6 Oct 2009 VOL 151 ISS 15
 FILE LAST UPDATED: 5 Oct 2009 (20091005/ED)
 REVISED CLASS FIELDS (/NCL) LAST RELOADED: Aug 2009
 USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Aug 2009

HCAplus now includes complete International Patent Classification (I reclassification data for the third quarter of 2009.

CAS Information Use Policies apply and are available at:

<http://www.cas.org/legal/infopolicy.html>

This file contains CAS Registry Numbers for easy and accurate

substance identification.

FILE REGISTRY

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 4 OCT 2009 HIGHEST RN 1187307-68-1
DICTIONARY FILE UPDATES: 4 OCT 2009 HIGHEST RN 1187307-68-1

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH June 26, 2009.

Please note that search-term pricing does apply when conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/support/stngen/stndoc/properties.html>

FILE LREGISTRY

LREGISTRY IS A STATIC LEARNING FILE

CAS INFORMATION USE POLICIES, ENTER HELP USAGETERMS FOR DETAILS.

FILE ZCPLUS

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications. The CA Lexicon is the copyrighted intellectual property of the American Chemical Society and is provided to assist you in searching databases on STN. Any dissemination, distribution, copying, or storage of this information, without the prior written consent of CAS is strictly prohibited.

FILE COVERS 1907 - 6 Oct 2009 VOL 151 ISS 15

FILE LAST UPDATED: 5 Oct 2009 (20091005/ED)

REVISED CLASS FIELDS (/NCL) LAST RELOADED: Aug 2009

USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Aug 2009

ZCAplus now includes complete International Patent Classification (I reclassification data for the third quarter of 2009.

CAS Information Use Policies apply and are available at:

<http://www.cas.org/legal/infopolicy.html>

This file contains CAS Registry Numbers for easy and accurate substance identification.

FILE LCA
LCA IS A STATIC LEARNING FILE

THIS FILE CONTAINS CAS REGISTRY NUMBERS FOR EASY AND ACCURATE SUBSTANCE IDENTIFICATION.

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

FILE PASCAL
FILE LAST UPDATED: 5 OCT 2009 <20091005/UP>
FILE COVERS 1977 TO DATE.

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION IS AVAILABLE IN THE BASIC INDEX (/BI) FIELD <<<

FILE JAPIO
FILE LAST UPDATED: 30 SEP 2009 <20090930/UP>
MOST RECENT PUBLICATION DATE: 25 JUN 2009 <20090625/PD>
>>> GRAPHIC IMAGES AVAILABLE <<<

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION (SLART) IS AVAILABLE IN THE BASIC INDEX (/BI) FIELD <<<

FILE METADEX
FILE LAST UPDATED: 22 SEP 2009 <20090922/UP>
FILE COVERS 1966 TO DATE.

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN THE BASIC INDEX (/BI) <<<

>>> METADEX will load additionally newly included old documents.
If you are not interested in retrieving these older documents we recommend to modify your SDI by excluding them by publication year (PY). E.G. => NOT PY<XXXX <<<

FILE ENERGY

FILE LAST UPDATED: 6 OCT 2009 <20091006/UP>
FILE COVERS 1974 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
THE BASIC INDEX >>>

FILE EMA
FILE LAST UPDATED: 22 SEP 2009 <20090922/UP>
FILE COVERS 1986 TO DATE.

>>> EMA will load additionally newly included old documents.
If you are not interested in retrieving these older documents
we recommend to modify your SDI by excluding them by publication
year (PY). E.G. => NOT PY<XXXX <<<

FILE INSPEC
FILE LAST UPDATED: 5 OCT 2009 <20091005/UP>
FILE COVERS 1898 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
THE ABSTRACT (/AB), BASIC INDEX (/BI) AND TITLE (/TI) FIELDS >>

FILE COMPENDEX
FILE LAST UPDATED: 5 OCT 2009 <20091005/UP>
FILE COVERS 1970 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION IS AVAILABLE IN
THE BASIC INDEX (/BI), ABSTRACT (/AB), and TITLE (/TI) FIELDS >

<<< Reloaded and enhanced COMPENDEX file is now available
- see 'HELP RLOAD' for details <<<

FILE WPIX
FILE LAST UPDATED: 1 OCT 2009 <20091001/UP>
MOST RECENT UPDATE: 200963 <200963/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE
>>> Now containing more than 1.4 million chemical structures in DCR

>>> IPC, ECLA, US National Classifications and Japanese F-Terms
and FI-Terms have been updated with reclassifications to
mid-June 2009.
No update date (UP) has been created for the reclassified
documents, but they can be identified by
specific update codes (see HELP CLA for details)<<<

FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE,
PLEASE VISIT:

http://www.stn-international.com/stn_guide.html

FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES, SEE
<http://scientific.thomsonreuters.com/support/patents/coverage/latest>

EXPLORE DERWENT WORLD PATENTS INDEX IN STN ANAVIST, VERSION 2.0:
http://www.stn-international.com/DWPAnaVist2_0608.html

>>> HELP for European Patent Classifications see HELP ECLA, HELP ICO

=> d 1115 1-2 bib abs ind

YOU HAVE REQUESTED DATA FROM FILE 'ENERGY, INSPEC, WPIX, HCAPLUS' - CONTINUE? (Y)/N:y

L115 ANSWER 1 OF 10 ENERGY COPYRIGHT 2009 USDOE/IEA-ETDE on STN
 AN 1988(19):155033 ENERGY Full-text
 TI Electrocatalyst and fuel cell electrode using the same.
 AU Wan, C.-Z. [Canada]
 CS Assignee(s): Englehard Corp., USA
 PI CA 1219249 17 Mar 1987
 v p.
 DT Patent
 CY Canada
 LA English
 AB An improved electocatalyst comprises a supported platinum-gallium alloy catalyst of up to 50 atomic percent gallium, preferably of 10 to 30 atomic percent gallium, the balance platinum. The platinum-gallium alloy is supported, preferably on carbon powder or the like and shows greater activity for oxygen reduction and better resistance to sintering than does a comparable platinum catalyst. A fuel cell electrode especially suited for use as a phosphoric acid fuel cell cathode comprises the supported platinum-gallium alloy electocatalyst bound to an acid resistant support member.
 CC *300503; 360101
 CT *ELECTROCATALYSTS; *ACID ELECTROLYTE FUEL CELLS: *CATALYTIC EFFECTS; *GALLIUM ALLOYS: *CATALYTIC EFFECTS; *ACID ELECTROLYTE FUEL CELLS: *CATHODES; *ACID ELECTROLYTE FUEL CELLS: *ELECTROCATALYSTS; FABRICATION; PERFORMANCE; PHOSPHORIC ACID; PLATINUM ALLOYS
 BT ALLOYS; CATALYSTS; DIRECT ENERGY CONVERTERS; ELECTROCHEMICAL CELLS; ELECTRODES; FUEL CELLS; HYDROGEN COMPOUNDS; INORGANIC ACIDS; PLATINUM METAL ALLOYS

L115 ANSWER 2 OF 10 INSPEC (C) 2009 IET on STN

AN 1991:3900219 INSPEC DN A1991-082360 Full-text
 TI Small cluster effects in WC/Pt thin film **catalyst**
 deposited by pulsed laser co-ablation method
 AU Ghaisas, S.; Ogale, S.B. (Dept. of Phys., Poona Univ., Pune, India)
 SO Materials Letters (March 1991), vol.10, no.11-12, p. 540-4, 17
 refs.
 CODEN: MLETDJ, ISSN: 0167-577X
 Price: 0167-577X/91/\$03.50
 DT Journal
 TC Experimental
 CY Netherlands
 LA English
 AN 1991:3900219 INSPEC DN A1991-082360 Full-text
 AB A possibility for the synthesis of **catalytic** electrodes by the
 method of laser co-ablation has been explored. The method has been
 used to obtain small dispersed clusters of platinum in a tungsten
 carbide matrix. The resulting WC/Pt composite thin films have been
 tested for their **catalytic** activity for H⁺ reduction in 0.6 N HClO₄
 solution. The results indicate that WC/Pt thin film containing small
 clusters of **platinum** (about 0. 6 atomic percent) are orders of
 magnitude more active than the ones without platinum and the ones
 richer in their platinum content. Low-angle X-ray diffraction (XRD)
 and X-ray photoelectron spectroscopy (XPS) have been employed to
 obtain structural and compositional information about the samples.
 Scanning electron microscopy (SEM) is used to reveal cluster
 morphologies of the films with different platinum contents
 AN 1991:3900219 INSPEC DN A1991-082360 Full-text
 CC A8265J Heterogeneous catalysis at surfaces and other surface
 reactions; A6855 Thin film growth, structure, and epitaxy; A8115J
 Ion plating and other vapour deposition
 CT **catalysts**; metal clusters; platinum; scanning electron
 microscope examination of materials; tungsten compounds; vapour
 deposited coatings; X-ray diffraction examination of materials;
 X-ray photoelectron spectra
 ST low angle X-ray diffraction; composition; structure; scanning
 electron microscopy; thin film **catalyst**; pulsed laser
 co-ablation; synthesis; electrodes; dispersed clusters; composite;
 H⁺ reduction; X-ray photoelectron spectroscopy; morphologies; HClO₄
 solution; WC-Pt
 CHI WCPt ss, Pt ss, C ss, W ss; HClO₄ ss, Cl ss, O₄ ss, H ss, O ss
 ET Pt; O; Cl; C*W; WC; W cp; cp; C cp; H; H+; H ip 1; ip 1; Cl*H*O;
 HClO₄; H cp; Cl cp; O cp

=> d 1115 3-5 full

YOU HAVE REQUESTED DATA FROM FILE 'ENERGY, INSPEC, WPIX, HCAPLUS' - CONTINUE? (Y)/N:y

L115 ANSWER 3 OF 10 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN
AN 2007-359934 [34] WPIX Full-text
DNC C2007-130659 [34]
DNN N2007-267854 [34]
TI Production of structure having three-dimensional network skeleton useful in fuel cell involves providing film containing first material of noble metal that is dispersed in second material; and removing the second material by dry etching
DC A97; L03; X16
IN DEN T; HORIE R; OKURA H; YASUI N
PA (CANO-C) CANON KK
CYC 2
PI US 20070034602 A1 20070215 (200734)* EN 14[6]
JP 2007044675 A 20070222 (200734) JA 15
ADT US 20070034602 A1 US 2006-497391 20060802; JP 2007044675 A JP
2005-234618 20050812
PRAI JP 2005-234618 20050812
IPCI B01D0069-00 [I,C]; B01D0069-12 [I,A]; B01D0071-00 [I,C]; B01D0071-02
[I,A]; B01J0023-42 [I,A]; B01J0023-42 [I,C]; B01J0035-00 [I,C];
B01J0035-04 [I,A]; C03C0025-68 [I,A]; C03C0025-68 [I,C]; H01M0004-86
[I,A]; H01M0004-86 [I,C]; H01M0004-90 [I,C]; H01M0004-92 [I,A];
H01M0008-02 [I,A]; H01M0008-02 [I,C]; H01M0008-10 [I,A]; H01M0008-10
[I,C]
NCL NCLM 216/058.000
FCL B01D0069-12; B01D0071-02 500; B01J0023-42 M; B01J0035-04 331 A;
H01M0004-86 M; H01M0004-92; H01M0008-02 E; H01M0008-10
FTRM 4D006; 4G069; 4G169; 5H018; 5H026; 4G169/AA02; 5H018/AA06;
5H026/AA06; 5H018/BB01; 5H026/BB01; 4G169/BB02.A; 4G169/BB02.B;
5H026/BB06; 5H018/BB07; 5H026/BB10; 5H018/BB11; 5H018/BB12;
5H018/BB16; 4G169/BC72.A; 4G169/BC75.A; 4G169/BC75.B; 4G169/CC32;
5H026/CX04; 4G169/EB11; 4G169/EB19; 4G169/EC27; 5H018/EE02;
5H026/EE02; 5H018/EE03; 5H026/EE11; 5H018/EE17; 5H026/EE18;
4D006/GA41; 5H018/HH03; 5H026/HH03; 5H018/HH04; 5H026/HH04;
5H018/HH05; 5H026/HH05; 4D006/MA06; 4D006/MA28; 4D006/MB01;
4D006/MC02; 4D006/MC28; 4D006/MC30; 4D006/MC72; 4D006/MC73;
4D006/MC74; 4D006/NA33; 4D006/NA46; 4D006/NA50; 4D006/NA64;
4D006/PA01; 4D006/PB18; 4D006/PB66; 4D006/PC80
AB US 20070034602 A1 UPAB: 20070529
NOVELTY - Production of a structure having a three-dimensional network skeleton involves providing a film containing a first material and a second material, where the first material contains a noble metal and is dispersed in the second material; and removing the second material contained in the film by dry etching.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) a structure having a three-dimensional network skeleton composed of a material including a noble metal, the maximum diameter of a transverse section of the skeleton is less than or equal to 100 nm;

(2) a membrane electrode assembly for a fuel cell comprising a solid polymer electrolyte, and a **catalyst** layer comprising the structure; and

(3) a fuel cell comprising the membrane electrode assembly, an anodic fuel diffusion layer, a cathodic fuel diffusion layer, an anodic collector, and a cathodic collector, where the membrane electrode assembly is disposed between the anodic fuel diffusion layer and the cathodic fuel diffusion layer, and the anodic fuel diffusion layer and the cathodic fuel diffusion layer are disposed between the anodic collector and the cathodic collector.

USE - For production of a structure having a three-dimensional network skeleton useful in membrane electrode assembly for fuel cell (claimed); and also useful for a small mobile device, e.g. mobile phone, notebook computer or digital video camera, to an automotive fuel cell, residential fuel cell and small industrial fuel cell.

ADVANTAGE - The process allows the stable production of the structure. The membrane electrode obtained from the structure has high power-generation efficiency.

TECH ELECTRONICS - Preferred Cell: In the fuel cell, the **catalyst** layer is disposed between the solid polymer electrolyte and one of the anodic fuel diffusion layer and the cathodic fuel diffusion layer.

INORGANIC CHEMISTRY - Preferred Method: The amount of the first material in the film is 5 - 40 (preferably 5 - 20) atomic percent of the total amount of the first material and the second material. The dry etching is nonplasma etching using a fluorine-based reactant gas. Preferred Components: The first material is platinum or palladium and the second material is silicon. Preferred Structure: The maximum diameter of the transverse section of the skeleton is less than or equal to 20 nm. The porosity of the structure is 30 - 95 (preferably 60 - 95)%. In the structure, the material forming the skeleton is a noble metal of platinum or palladium, an alloy containing platinum or palladium, or a silicide of platinum or palladium. In the assembly, the **catalyst** layer additionally comprises fine particles formed of a substance that functions as a **catalyst** or as a promoter for enhancing **catalytic** activity of the fuel cell; and an electron transferring material as a carrier.

ABEX EXAMPLE - A four-inch (101.6 mm) copper target was used on a backing plate. Sputtering was performed with a radio frequency (RF) power supply at an argon (Ar) flow rate of 50 sccm, a discharge

pressure of 0.7 Pa, and an input power of 300 W. The substrate temperature was room temperature. A thin copper film having a thickness of 50 nm was formed on silicon (Si) wafer. Subsequently, a platinum-silicon composite film having a thickness of 100 nm was formed on the copper film on the Si wafer by RF magnetron sputtering. A four-inch (101.6 mm) silicon target including five pieces of platinum chips on it was used on a backing plate. Sputtering was performed with a RF power supply at an Ar flow rate of 19 sccm, a discharge pressure of 0.11 Pa, and an input power of 120 W. The substrate temperature was room temperature to obtain platinum-silicon composite film (containing 30 atomic percent of platinum) with field emission scanning electron microscope (FE-SEM). Then, the platinum-silicon composite film was fixed to a four-inch (101.6 mm) silicon wafer with a Kapton (RTM: tape). The silicon wafer was placed on a turntable of a XeF₂ dry etching apparatus. The platinum-silicon composite film was irradiated with one pulse of a XeF₂ molecular flow at the diffusive pressure of a XeF₂ diffusion container of 60 Pa. Silicon in the composite film was selectively etched away to provide a platinum three-dimensional network structure. The FE-SEM observation of the film after the XeF₂ dry etching showed that the film had a platinum three-dimensional network skeleton having a porosity of 65% and an average diameter of about 5 nm and extending in the thickness direction. The film was dipped into aqueous nitric acid to dissolve copper, to isolate a platinum three-dimensional network nano-structure having a thickness of 100 nm and including a skeleton having a maximum diameter of 5 nm.

FS CPI; EPI
MC CPI: A12-E06B; L03-E04B
EPI: X16-E06A5C

L115 ANSWER 4 OF 10 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN
AN 2006-221276 [23] WPIX [Full-text](#)
DNC C2006-072675 [23]
DNN N2006-190081 [23]
TI Catalyst composition for use as catalyst in fuel cell electrodes comprises platinum, copper and nickel in total concentration of greater than ninety-five atomic percent
DC L03; X16
IN CENDAK K J; CHONDROUDIS K; DEVENNEY M; FAN Q; GIAQUINTA D M; GORER A; OYANAGI H; STRASSER P; URATA K
PA (HOND-C) HONDA GIKEN KOGYO KK; (SYMY-N) SYMYX TECHNOLOGIES INC
CYC 1
PI US 20060058185 A1 20060316 (200623)* EN 31[4]
ADT US 20060058185 A1 Provisional US 2004-602459P 20040818; US 20060058185 A1 US 2005-205557 20050817

PRAI US 2005-205557 20050817
 US 2004-602459P 20040818
 IPCI C22C0005-00 [I,C]; C22C0005-04 [I,A]
 EPC B01J0019-00C; B01J0023-89F; B01J0037-34; C22C0005-04; C22C0009-00;
 C22C0009-06; C22C0030-00; C40B0030-08; C40B0040-18; C40B0050-18;
 H01M0004-92B
 ICO L01J0219:00C10D2; L01J0219:00C2D24B; L01J0219:00C2D24D;
 L01J0219:00C4L12; L01J0219:00C4L6; L01J0219:00C6J; L01J0219:00C6P;
 T01M0004:92S
 NCL NCLM 502/326.000
 NCLS 420/468.000
 AB US 20060058185 A1 UPAB: 20060405
 NOVELTY - A catalyst composition comprises platinum, copper and nickel. The sum of the concentrations of platinum, copper and nickel is greater than 95 atomic percent. The concentration of platinum is 5-80 atomic percent.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method for preparing a catalyst composition from a catalyst precursor composition, comprising subjecting the precursor composition to conditions sufficient to remove a present portion of the copper or nickel, such that the resulting catalyst composition comprises platinum, copper and nickel, the sum of the concentrations of platinum, copper and nickel is greater than 95 atomic percent, and the concentration of platinum is greater than 55 atomic percent.

USE - For use as catalyst in fuel cell electrodes.

ADVANTAGE - The composition exhibits favorable electrocatalytic activity while having reduced amounts of platinum, as compared to a platinum standard.

DESCRIPTION OF DRAWINGS - The drawing shows a cross-sectional view of the assembled fuel cell.

- Fuel cell (20)
- Exchange membrane (21)
- Anode (22)
- Cathode (23)
- Current collects (24, 25)
- Sealants (26, 27)
- Fuel chamber (28)
- Air chamber (29)

TECH INORGANIC CHEMISTRY - Preferred Composition: The composition consists of platinum, copper and nickel, where platinum, copper or nickel is in the metallic oxidation state. The composition comprises 55-75 (preferably greater than 60) at.% platinum, 20-45 (preferably 25-35) at.% copper, and 1-15 (preferably 1-25) at.% nickel. The composition has an observed lattice constant that is less than a lattice constant as calculated in accordance with Vegard's Law. Preferred Method: The catalyst precursor composition is contacted with an acidic solution to solubilize a portion of the

copper or nickel present. It subjected to an electrochemical reaction where a hydrogen-containing fuel and oxygen are converted to reaction products and electricity in a fuel cell comprising anode, proton exchange membrane, cathode, **catalyst** precursor composition, and electrically conductive external circuit connecting the anode and cathode, the method comprising contacting the hydrogen-containing fuel or the oxygen and the **catalyst** precursor composition to oxidize the hydrogen-containing fuel or **catalytically** reduce the oxygen, and to dissolved in situ from the **catalyst** precursor composition copper or nickel.

FS CPI; EPI
MC CPI: L03-E04A2; L03-E04B1
EPI: X16-C01C; X16-E06A5A

L115	ANSWER 5 OF 10	WPIX COPYRIGHT 2009	THOMSON REUTERS on STN
AN	2005-416391 [42]	WPIX <u>Full-text</u>	
CR	2005-240600;	2006-576884	
DNC	C2005-127398 [42]		
DNN	N2005-337776 [42]		
TI	Catalyst composition for use in fuel cells for e.g. electric vehicles, computers, cell phones, comprises conductive fibers bearing nanoparticles		
DC	A85; L02; L03; M26; P42; X16		
IN	DONG Y; LI Y; LI Y Q; WANG N		
PA	(INTE-N) INTEMATIX CORP		
CYC	108		
PI	US 20050112450	A1 20050526 (200542)*	EN 30[14]
	WO 2005084399	A2 20050915 (200561)	EN
	EP 1754234	A2 20070221 (200717)	EN
	CN 1954392	A 20070425 (200759)	ZH
	JP 2007526616	W 20070913 (200762)	JA 33
	KR 2007046784	A 20070503 (200803)	KO
ADT	US 20050112450 A1 Provisional US 2003-501158P 20030908; US 20050112450 A1 Provisional US 2004-549712P 20040302; US 20050112450 A1 CIP of US 2004-823088 20040412; US 20050112450 A1 US 2004-898669 20040723; CN 1954392 A CN 2005-80011129 20050302; EP 1754234 A2 EP 2005-730186 20050302; WO 2005084399 A2 WO 2005-US7343 20050302; EP 1754234 A2 WO 2005-US7343 20050302; JP 2007526616 W WO 2005-US7343 20050302; JP 2007526616 W JP 2007-502081 20050302; KR 2007046784 A WO 2005-US7343 20050302; KR 2007046784 A KR 2006-720287 20060929		
FDT	EP 1754234	A2 Based on WO 2005084399	A; JP 2007526616 W
	Based on WO 2005084399	A; KR 2007046784	A Based on WO 2005084399 A
PRAI	US 2004-898669	20040723	
	US 2003-501158P	20030908	
	US 2004-549712P	20040302	
	US 2004-823088	20040412	

IC ICM H01M

IPCI C01B0031-00 [I,A]; C01B0031-00 [I,C]; C01B0031-00 [I,C]; H01B0001-04 [I,A]; H01B0001-04 [I,C]; H01B0001-04 [I,C]; H01M0004-86 [I,A]; H01M0004-86 [I,C]; H01M0004-88 [I,A]; H01M0004-88 [I,C]; H01M0004-90 [I,A]; H01M0004-90 [I,C]; H01M0004-90 [I,C]; H01M0004-96 [I,A]; H01M0004-96 [I,C]; H01M0008-02 [I,A]; H01M0008-02 [I,C]; H01M0008-10 [I,A]; H01M0008-10 [I,C]

IPCR B01J0021-00 [I,C]; B01J0021-18 [I,A]; B01J0023-42 [I,A]; B01J0023-42 [I,C]; B05D0005-12 [I,A]; B05D0005-12 [I,C]; H01B0001-00 [I,A]; H01B0001-00 [I,C]; H01B0001-04 [I,A]; H01B0001-04 [I,C]; H01M0004-88 [I,A]; H01M0004-88 [I,C]; H01M0004-90 [I,A]; H01M0004-90 [I,C]; H01M0004-92 [I,A]; H01M0004-96 [I,A]; H01M0004-96 [I,C]; H01M0008-10 [I,A]; H01M0008-10 [I,C]

NCL NCLM 429/044.000

NCLS 252/500.000; 252/502.000; 252/503.000

FCL H01M0004-88 K; H01M0004-90 M; H01M0004-90 X; H01M0004-96 B;
H01M0008-02 P; H01M0008-10
Main: H01M0004-96 B
Secondary: H01M0004-88 K; H01M0004-90 M; H01M0004-90 X; H01M0008-02 P; H01M0008-10

FTRM 5H018; 5H026; 5H018/AA06; 5H026/AA06; 5H018/AS01; 5H018/BB07;
5H026/EE19; 5H018/HH01

AB US 20050112450 A1 UPAB: 20090928
NOVELTY - A **catalyst** composition comprises conductive fibers bearing nanoparticles.
USE - For use in fuel cells, e.g. polymer electrolyte membrane (PEM) fuel cells for e.g. electric vehicles, computers, cell phones, other electronic devices, home electrical power generation systems.
ADVANTAGE - The carbon nanotubes deposited on the carbon fiber papers enhance the **catalyst** surface area and provide a micro gas-diffusion structure.
DESCRIPTION OF DRAWINGS - The figure shows a schematic of a detailed structure of **catalyst** thin-film/carbon nanotubes layer/carbon fiber-sheet.

TECH CERAMICS AND GLASS - Preferred Materials: The conductive fibers are carbon fibers or a porous metal sheet. The carbon fibers comprise a porous electrode, a carbon paper or a carbon cloth. The nanoparticles are nanotubes, nanofibers, nanohorns, nanopowders, nanospheres, or quantum dots. The nanotubes have a length less than 50 microns and a diameter 1 nm to less than 100 nm.
METALLURGY - Preferred Materials: The carbon nanotubes are seeded with **catalyst**(s) comprising cobalt (Co), nickel (Ni), vanadium (V), chromium (Cr), platinum (Pt), ruthenium (Ru), molybdenum (Mo), tungsten (W), tantalum (Ta), and/or zirconium (Zr). The **catalyst** may be iron nickel cobalt FexNiyCol-x-y (x, y=0-1), cobalt molybdenum Col-xMox (x=0-0.3), cobalt nickel molybdenum Col-x-yNixMoy (x=0.1-0.7; y=0-0.3), cobalt nickel

vanadium chromium $\text{Co}_{1-x-y-z}\text{Ni}_x\text{V}_y\text{Cr}_z$ ($x=0-0.7$; $y, z=0-0.2$), nickel molybdenum aluminum $\text{Ni}_{1-x-y}\text{Mo}_x\text{Al}_y$ ($x, y=0-0.2$), or cobalt nickel aluminum $\text{Co}_{1-x-y}\text{Ni}_x\text{Al}_y$ ($x=0-0.7$; $y=0-0.2$). The catalyst may be $\text{Co}_{8.8}\text{Mo}_{1.2}$, $\text{Co}_{2.2}\text{Ni}_{5.6}\text{Mo}_{2.2}$, $\text{Co}_{5.7}\text{Ni}_{2.1}$, $\text{V}_{1.1}\text{Cr}_{1.1}$, $\text{Ni}_{8.0}\text{Mo}_{1.0}\text{Al}_{1.0}$, or $\text{Co}_{6.4}\text{Ni}_{2.4}\text{Al}_{1.2}$. The nanoparticles are coated with a 1-1000 (preferably 5-500) Angstrom continuous thin film comprising a platinum alloy and at least partially covering the nanoparticles. Alternatively, the nanoparticles are coated with a non-continuous thin film comprising a platinum alloy. The thin film comprises 5-100 Angstrom thick islands in an area of 1-104 nm². The thin film comprises an alloy comprising platinum (Pt), V and Co, Ni, Mo, Ta, W, and/or Zr. The alloy comprises up to 50% (preferably up to 12%) mole ratio or atomic percentage platinum. The alloy may have the formula $\text{Pt}_x\text{V}_y\text{Co}_z\text{Ni}_w$.
 $x=\text{greater than } 0.06 \text{ and less than } 1$ (preferably 0.12);
 $y=\text{greater than } 0 \text{ and less than } 1$ (preferably 0.07);
 $z=\text{greater than } 0 \text{ and less than } 1$ (preferably 0.56);
 $w=\text{greater than } 0 \text{ and less than } 1$ (preferably 0.25);
 $x+y+z+w=1$.

POLYMERS - Preferred Materials: The carbon fibers comprise a carbon-impregnated polymer.

FS CPI; GMPI; EPI
MC CPI: L03-A02B; L03-E04A2; L03-E04B; M26-B
EPI: X16-C01C; X16-E06A1A; X16-E06A5A

=> d 1115 6-10 bib abs hitind
YOU HAVE REQUESTED DATA FROM FILE 'ENERGY, INSPEC, WPIX, HCAPLUS' - CONTINUE? (Y)/N:y

L115 ANSWER 6 OF 10 HCAPLUS COPYRIGHT 2009 ACS on STN
AN 2008:1241230 HCAPLUS Full-text
DN 149:451842
TI Platinum, tungsten, and nickel or zirconium containing electrocatalysts
IN He, Ting; Kreidler, Eric Rolland
PA Honda Motor Co., Ltd., Japan
SO U.S., 6pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 2

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	---	-----	-----	-----

PI	US 7435504	B2	20081014	US 2005-210761	
					200508
					25
	US 20070049490	A1	20070301		
	WO 2007024489	A2	20070301	WO 2006-US31097	
					200608
					09
	WO 2007024489	A3	20070412		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW				
	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA				
	JP 2009506500	T	20090212	JP 2008-527961	
					200608
					09
	US 20090023051	A1	20090122	US 2008-238968	
					200809
					26

PRAI US 2005-210761 A 20050825
 WO 2006-US31097 W 20060809

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The present teachings are directed toward electrocatalyst compns. of alloys of platinum, tungsten and one of either of nickel or zirconium for use in fuel cells. The alloys consist essentially of platinum present in an atomic percentage ranging between about 20% and about 45%, tungsten present in an atomic percentage ranging between about 30% and about 70%, and one of either nickel present in an atomic percentage ranging between about 5% and about 25%, or zirconium present in an atomic percentage ranging between about 5% and about 40%.

INCL 429044000; 502308000; 502313000; 502315000; 420432000; 420580000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 56, 67

IT Catalysts

(electrocatalysts; platinum, tungsten, and nickel or zirconium containing electrocatalysts for fuel cells)

RE.CNT 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L115 ANSWER 7 OF 10 HCAPLUS COPYRIGHT 2009 ACS on STN
 AN 2007:228229 HCAPLUS Full-text
 DN 146:299222
 TI Platinum, tungsten, and nickel or zirconium containing electrocatalysts
 IN He, Ting; Kreidler, Eric Rolland
 PA Honda Motor Co., Ltd., Japan
 SO PCT Int. Appl., 20 pp.
 CODEN: PIXXD2
 DT Patent
 LA English
 FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
	-----	----	-----	-----	-----	
PI	WO 2007024489	A2	20070301	WO 2006-US31097	20060809	
	WO 2007024489	A3	20070412			
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW					
	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA					
	US 7435504	B2	20081014	US 2005-210761	20050825	
US	20070049490	A1	20070301			
JP	2009506500	T	20090212	JP 2008-527961	20060809	
PRAI	US 2005-210761	A	20050825			
	WO 2006-US31097	W	20060809			
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT						
AB	The present teachings are directed toward electrocatalyst compns. of alloys of platinum, tungsten and one of either of nickel or zirconium for use in fuel cells. The alloys consist essentially of platinum present in an atomic percentage ranging between about 20% and about 45%, tungsten present in an atomic percentage ranging between about					

30% and about 70%, and one of either nickel present in an atomic percentage ranging between about 5% and about 25%, or zirconium present in an atomic percentage ranging between about 5% and about 40%.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 67

IT **Catalysts**

(electrocatalysts; platinum, tungsten, and nickel or zirconium containing electrocatalysts for fuel cells)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L115 ANSWER 8 OF 10 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2007:758490 HCAPLUS Full-text

DN 147:169700

TI Platinum and titanium containing electrocatalysts

IN He, Ting; Kreidler, Eric Rolland

PA Honda Motor Co., Ltd., Japan

SO U.S. Pat. Appl. Publ., 13pp., Cont.-in-part of U.S. Ser. No. 370,991.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 20070160897	A1	20070712	US 2006-429251	20060508
	US 7318977	B2	20080115		
	US 20070160895	A1	20070712	US 2006-326350	20060106
	US 20070212590	A1	20070913	US 2006-370991	20060309
WO	2007081774	A2	20070719	WO 2007-US225	20070105

WO 2007081774 A3 20070913

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV,

SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM,
ZW
 RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
 IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR,
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD,
 TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
 ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA
 JP 2009522100 T 20090611 JP 2008-549565

200701
05

PRAI US 2006-326350 A2 20060106
 US 2006-370991 A2 20060309
 US 2006-429251 A 20060508
 US 2006-429252 A 20060508
 WO 2007-US225 W 20070105

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The present teachings are directed toward electrocatalyst compns. of platinum, titanium, a third, fourth and possibly fifth metal for use in fuel cells. The electrocatalyst composition is composed essentially of platinum present in an atomic percentage ranging between about 30% and about 85%, titanium present in an atomic percentage ranging between about 5% and about 30%, a third metal present in an atomic percentage ranging between about 1% and about 30%, a fourth metal present in an atomic percentage ranging between about 1% and about 30%, and a possible fifth metal present in an atomic percentage ranging between about 1% and about 30%. The third metal can be at least one member selected from the group consisting of nickel, vanadium, molybdenum, copper, manganese, iron, cobalt, ruthenium, rhodium, palladium, silver, osmium, iridium and gold. The fourth and fifth metals are different from the third metal and each other and can be selected from the group consisting of scandium, vanadium, chromium, manganese, iron, nickel, copper, zinc, yttrium, zirconium, niobium, molybdenum, cadmium, tin, hafnium, tantalum and rhenium.

INCL 429040000; 502339000; 502326000; 502330000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 56, 67

IT Catalysts

(electrocatalysts; platinum and titanium containing
 electrocatalysts)

OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2
 CITINGS)

RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

DN 145:11419
 TI Platinum and tungsten containing electrocatalysts for use in fuel cells
 IN He, Ting; Kreidler, Eric Rolland; Nomura, Tadashi; Minor, Lara
 PA USA
 SO U.S. Pat. Appl. Publ., 7 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 20060121332	A1	20060608	US 2004-4235	200412 06
	WO 2006062954	A1	20060615	WO 2005-US44080	200512 05
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	US 20060141335	A1	20060629	US 2005-294465	200512 06

PRAI US 2004-4235 A 20041206

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The present teachings are directed toward electrocatalyst composition of an alloy of platinum and tungsten for use in fuel cells. The alloy consists essentially of platinum metal present in an atomic percentage ranging between about 20% and about 50%, and tungsten metal present in an atomic percentage ranging between about 50% and about 80%.

INCL 429040000; 429044000; 502339000; 420466000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 56, 67
 IT Catalysts
 (electrocatalysts; platinum and tungsten containing

electrocatalysts
 for use in fuel cells)

L115 ANSWER 10 OF 10 HCAPLUS COPYRIGHT 2009 ACS on STN
 AN 1992:600438 HCAPLUS Full-text
 DN 117:200438
 OREF 117:34445a,34448a
 TI Catalytic influence of commercial ruthenium, rhodium,
 platinum, and palladium (.apprx.0, 1
 atomic percent) intercalated in graphite on the
 hydrogen evolution reaction
 AU Fournier, Joel; Wrona, Piotr K.; Lasia, Andrzej; Lacasse, Robert;
 Lalancette, Jean Marc; Menard, Hugues
 CS Dep. Chim., Univ. Sherbrooke, Sherbrooke, QC, J1K 2R1, Can.
 SO Journal of the Electrochemical Society (1992), 139(9), 2372-8
 CODEN: JESOAN; ISSN: 0013-4651
 DT Journal
 LA English
 AB Graphite electrodes intercalated with various metals (Ni, Co, Pd, Pt,
 Rh, and Ru) have been bonded with an inorg. polymer LaPO₄ and used as
 cathodes in the hydrogen evoln. reactions (HER) in 1M KOH. Four of
 the most active electrodes showed very good mech. and electrochem.
 stability. The overvoltage of the HER at 0.10 A cm⁻² decreased in
 the following order: -525 mV, for pure graphite and -254, -137, -103,
 and -58 mV, for the Pd/C, Rh/C, Pt/C, and Ru/C electrodes, resp. The
 kinetics of the HER for two electrodes (Ru/C and Pd/C) were measured
 with the use of an a.c. impedance technique. In both cases, the HER
 proceeds via the Volmer-Heyrovsky mechanism. The results obtained
 proved that the Pd/C electrode had a larger active surface area than
 the Ru/C one did.
 CC 72-2 (Electrochemistry)
 Section cross-reference(s): 67, 78
 IT Reduction **catalysts**
 (electrochem., graphite-platinum metal intercalated compds., for
 hydrogen evolution)
 OSC.G 11 THERE ARE 11 CAPLUS RECORDS THAT CITE THIS RECORD (11
 CITINGS)

=> d 1122 1-12 bib abs hitstr hitind

L122 ANSWER 1 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
 AN 2009:556178 HCAPLUS Full-text
 DN 150:499033
 TI Method for manufacturing alloyed platinum nanoparticle
catalysts by freeze-drying of metal precursors
 IN Strasser, Peter; Koh, Shirlaine; Mani, Prasanna; Ratndee,

Srivastava

PA University of Houston, USA
 SO U.S. Pat. Appl. Publ., 19pp.
 CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 20090114061	A1	20090507	US 2008-206587	200809 08

PRAI US 2007-970851P P 20070907

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB A method of producing de-alloyed nanoparticles, e.g., Pt75Cu25. In an embodiment, the method comprises admixing metal precursors, freeze-drying, annealing, and de-alloying the nanoparticles in situ. Further, in an embodiment de-alloyed nanoparticle formed by the method, wherein the nanoparticle further comprises a core-shell arrangement. The nanoparticle is suitable for electrocatalytic processes and devices. At least one precursor suspension comprises at least one metal chosen from gold, silver, nickel, palladium, chromium, molybdenum, manganese, titanium, scandium, tungsten, vanadium, and alloys thereof. Freeze-drying further comprises applying a vacuum at a temperature of at least about -100°. The catalyst particles in acid comprises soaking in an acid chosen from acetic acid, hydrochloric acid, nitric acid, sulfuric acid, perchloric acid, hydrobromic acid, hydroiodic acid, and combinations thereof.

INCL 075255000; 502340000; 502344000; 502325000; 502300000; 502319000;
 502321000; 502324000; 502350000; 502355000

CC 56-4 (Nonferrous Metals and Alloys)

Section cross-reference(s): 67, 72

ST platinum nanoparticle catalyst freeze drying annealing
 precursor electrochem

IT Electrochemistry

Freeze drying

Nanoparticles

(method for manufacturing alloyed platinum nanoparticle
 catalysts by freeze-drying of metal precursors)

IT Catalysts

(platinum nanoparticles; method for manufacturing alloyed platinum nanoparticle catalysts by freeze-drying of metal precursors)

IT Electrodes

(rotating disk electrodes; method for manufacturing alloyed

platinum

nanoparticle **catalysts** by freeze-drying of metal precursors)

IT 942228-50-4, Nafion NRE 212

RL: NUU (Other use, unclassified); USES (Uses)

(dispersion cast membrane; method for manufacturing alloyed

platinum

nanoparticle **catalysts** by freeze-drying of metal precursors)

IT 7601-90-3, Perchloric acid, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(electrolyte; method for manufacturing alloyed platinum nanoparticle

catalysts by freeze-drying of metal precursors)

IT 7664-93-9, Sulfuric acid, reactions

RL: RCT (Reactant); RGT (Reagent); RACT (Reactant or reagent)

(ion exchange agent; method for manufacturing alloyed platinum nanoparticle **catalysts** by freeze-drying of metal precursors)

IT 7440-06-4, Platinum, processes 39314-70-0, Copper 50, platinum 50 (atomic) 39328-94-4, Copper 75, **platinum 25** (

atomic) 64800-65-3, Copper 25, platinum 75 (atomic)

RL: CAT (Catalyst use); NANO (Nanomaterial); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(method for manufacturing alloyed platinum nanoparticle

catalysts by freeze-drying of metal precursors)

IT 64-19-7, Acetic acid, reactions 7647-01-0, Hydrochloric acid, reactions 7697-37-2, Nitric acid, reactions 10034-85-2,

Hydriodic acid 10035-10-6, Hydrobromic acid, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(method for manufacturing alloyed platinum nanoparticle

catalysts by freeze-drying of metal precursors)

IT 82534-00-7, Cobalt 75, **platinum 25** (

atomic) 1005456-14-3 1005456-15-4 1005456-16-5

RL: NANO (Nanomaterial); PEP (Physical, engineering or chemical process); PROC (Process)

(nanoparticles; method for manufacturing alloyed platinum

nanoparticle

catalysts by freeze-drying of metal precursors)

IT 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses

7440-02-0, Nickel, uses 7440-05-3, Palladium, uses

7440-20-2, Scandium, uses 7440-22-4, Silver, uses 7440-32-6,

Titanium, uses 7440-33-7, Tungsten, uses 7440-47-3,

Chromium, uses 7440-57-5, Gold, uses 7440-62-2,

Vanadium, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(platinum alloy component; method for manufacturing alloyed

platinum

nanoparticle **catalysts** by freeze-drying of metal precursors)

IT 1333-74-0, Hydrogen, reactions

RL: RGT (Reagent); RACT (Reactant or reagent)
(reversible hydrogen electrode; method for manufacturing alloyed platinum nanoparticle **catalysts** by freeze-drying of metal precursors)

IT 7440-44-0, Carbon, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; method for manufacturing alloyed platinum nanoparticle **catalysts** by freeze-drying of metal precursors)

L122 ANSWER 2 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2009:456857 HCAPLUS Full-text

DN 150:452243

TI De-alloyed membrane electrode assemblies for fuel cells

IN Strasser, Peter; Mani, Prasanna; Srivastava, Ratndeep

PA University of Houston System, USA

SO U.S. Pat. Appl. Publ., 20pp.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 20090098420	A1	20090416	US 2008-250992	200810 14

PRAI US 2007-979704P P 20071012

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB A method for membrane electrode assembly (MEA) fabrication for fuel cells using de-alloyed nanoparticle membranes as electrodes is presented. This method for fabrication of a fuel cell electrode assembly, comprises: preparing a **catalyst** coated membrane, forming a membrane electrode assembly, assembling a fuel cell, and de-alloying the membrane electrode assembly. Further described is a fuel cell comprising a de-alloyed **catalyst** and a cathode comprising, a 1st membrane electrode assembly, wherein the de-alloyed **catalyst** is coated on the membrane electrode assembly.

INCL 429013000; 427077000; 427078000; 429040000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56

IT Chromium alloy, base

Gold alloy, base

Manganese alloy, base

Molybdenum alloy, base

Nickel alloy, base

Palladium alloy, base

Scandium alloy, base

Silver alloy, base

Titanium alloy, base

Tungsten alloy, base

Vanadium alloy, base

RL: CAT (Catalyst use); TEM (Technical or engineered material use);

USES (Uses)

(de-alloyed membrane-electrode assemblies for fuel cells)

IT 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses
 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses
 7440-06-4, Platinum, uses 7440-20-2, Scandium, uses 7440-22-4,
 Silver, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses
 7440-44-0, Carbon, uses 7440-47-3, Chromium, uses
 7440-50-8, Copper, uses 7440-57-5, Gold, uses 7440-62-2,
 Vanadium, uses 51880-67-2, Copper 39, platinum 61 (atomic)
 934423-68-4, Copper 18, platinum 82 (atomic)
 RL: CAT (Catalyst use); TEM (Technical or engineered material use);
 USES (Uses)
 (de-alloyed membrane-electrode assemblies for fuel cells)

IT 39328-94-4, Copper 75, platinum 25 (atomic)
 RL: CAT (Catalyst use); NANO (Nanomaterial); TEM (Technical or engineered material use); USES (Uses)
 (nanoparticles, de-alloyed; de-alloyed membrane-electrode assemblies for fuel cells)

L122 ANSWER 3 OF 12 HCPLUS COPYRIGHT 2009 ACS on STN

AN 2008:1477126 HCPLUS Full-text

DN 150:22278

TI Fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells

IN Shui, Jianglan; Li, James C. M.

PA University of Rochester, USA

SO U.S. Pat. Appl. Publ., 19pp.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----
PI	US 20080305377	A1	20081211	US 2008-49723	200803

17

PRAI US 2007-895043P

P 20070315

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB Metallic nanofiber (nanowire) structures for use in fabrication of fuel cells are manufactured by: (1) providing a first solution containing a first material and a second material that includes at least one metal, (2) forming the first solution into composite fibers (containing the first and second materials), and (3) removing the first material from the composite fibers to produce a metallic nanofiber. The first material is a polymer that can be removed by pyrolysis in the final step. The metallic nanofiber structures can be used as fuel cell **catalysts**.

INCL 429030000; 264433000; 428397000; 429044000; 425174800E

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST long metallic nanowire proton exchange membrane fuel cell; nanofiber nanoparticle carbon fiber nanotube alloy fuel cell; metal organometallic salt fuel cell **catalyst**

IT Carbon black, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (Denka Black, Ketjen Black, and acetylene black, carbon-based material; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Carbon fibers, uses
 RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
 (E-TEK; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Carbon black, uses
 RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
 (Vulcan XC 72; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Nanofibers
 (carbon and metallic; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Nanotubes
 (carbon; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Nanoparticles
 (fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Polyoxyalkylenes, uses
 RL: REM (Removal or disposal); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)

(fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Polyoxyalkylenes, uses
 RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
 (fluorine- and sulfo-containing, ionomers, membrane; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Ionomers
 RL: TEM (Technical or engineered material use); USES (Uses)
 (membranes; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Nanotubes
 (metal; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Alloys, uses
 RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
 (nanofibers; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Fluoropolymers, uses
 RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylene-, sulfo-containing, ionomers, membrane; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Ionomers
 RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
 (polyoxyalkylenes, fluorine- and sulfo-containing, membrane; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT Fuel cells
 (proton exchange membrane; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT 7782-42-5, Graphite, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (carbon-based material; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel cells)

IT 10025-73-7, Chromium chloride (CrCl₃)
 RL: RGT (Reagent); RACT (Reactant or reagent)
 (chromium source; fabrication of long metal nanowires for use as **catalysts** in proton exchange membrane fuel

cells)

IT 9002-84-0, PTFE
 RL: TEM (Technical or engineered material use); USES (Uses)
 (coating material; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 10141-05-6, Cobalt nitrate ($\text{Co}(\text{NO}_3)_2$)
 RL: RGT (Reagent); RACT (Reactant or reagent)
 (cobalt source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 7447-39-4, Copper chloride (CuCl_2), reactions
 RL: RGT (Reagent); RACT (Reactant or reagent)
 (copper source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 16903-35-8, Tetrachloroauric acid
 RL: RGT (Reagent); RACT (Reactant or reagent)
 (gold source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 7758-94-3, Iron chloride (FeCl_2)
 RL: RGT (Reagent); RACT (Reactant or reagent)
 (iron source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 7440-50-8, Copper, uses
 RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
 (microwire; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 13478-18-7, Molybdenum chloride (MoCl_3)
 RL: RGT (Reagent); RACT (Reactant or reagent)
 (molybdenum source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-96-5,
 Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0,
 Nickel, uses 7440-04-2, Osmium, uses 7440-05-3,
 Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium,
 uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses
 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7,
 Tungsten, uses 7440-47-3, Chromium, uses 7440-48-4,
 Cobalt, uses 7440-55-3, Gallium, uses 7440-57-5, Gold, uses
 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-66-6,
 Zinc, uses 7440-67-7, Zirconium, uses 53886-70-7, Nickel
 75, platinum 25(atomic)
 RL: CAT (Catalyst use); TEM (Technical or engineered material use); NANO (Nanomaterial); USES (Uses)
 (nanofibers; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 7440-44-0, Carbon, uses
 RL: TEM (Technical or engineered material use); NANO (Nanomaterial);

USES (Uses)

(nanotubes; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 11107-69-0 11134-15-9 12623-53-9 12667-08-2 12779-05-4
 39339-47-4 50942-39-7 51402-57-4 60501-15-7 91810-23-0
 271596-25-9 887768-92-5 887768-93-6 1091604-86-2
 1091604-87-3

RL: TEM (Technical or engineered material use); NANO (Nanomaterial);
 USES (Uses)

(nanowires; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 7718-54-9, Nickel chloride (NiCl₂), reactions
 13138-45-9, Nickel nitrate

RL: RGT (Reagent); RACT (Reactant or reagent)

(nickel source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 7647-10-1, Palladium chloride (PdCl₂)

RL: RGT (Reagent); RACT (Reactant or reagent)

(palladium source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 15170-57-7, Platinum bisacetylacetone 18497-13-7, Chloroplatinic acid hexahydrate 421550-00-7

RL: RGT (Reagent); RACT (Reactant or reagent)

(platinum source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 9002-89-5, Polyvinyl alcohol 9003-20-7, Polyvinyl acetate
 9003-39-8, Poly(vinyl pyrrolidone) 24937-79-9, Poly(vinylidene fluoride) 25322-68-3, Poly(ethylene oxide)

RL: REM (Removal or disposal); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(pyrolytic removal of; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 10049-08-8, Ruthenium chloride (RuCl₃)

RL: RGT (Reagent); RACT (Reactant or reagent)

(ruthenium source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 7772-99-8, Tin chloride (SnCl₂), reactions

RL: RGT (Reagent); RACT (Reactant or reagent)

(tin source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 20193-56-0, Tungsten chloride (WC₁₃) 45000-93-9

RL: RGT (Reagent); RACT (Reactant or reagent)

(tungsten source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 12260-63-8, Vanadic acid

RL: RGT (Reagent); RACT (Reactant or reagent)
 (vanadium source; fabrication of long metal nanowires for use as
catalysts in proton exchange membrane fuel cells)

L122 ANSWER 4 OF 12 HCPLUS COPYRIGHT 2009 ACS on STN
 AN 2008:1136610 HCPLUS Full-text
 DN 149:387529
 TI **Catalytic** Oxidation of H₂ by N₂O in the Gas Phase: O-Atom Transport with Atomic Metal Cations
 AU Blagojevic, Voislav; Bozovic, Andrea; Orlova, Galina; Bohme, Diethard K.
 CS Department of Chemistry, Centre for Research in Mass Spectrometry and Centre for Research in Earth and Space Science, York University, Toronto, ON, M3J 1P3, Can.
 SO Journal of Physical Chemistry A (2008), 112(41), 10141-10146
 CODEN: JPCAFH; ISSN: 1089-5639
 PB American Chemical Society
 DT Journal
 LA English
 AB Twenty-five atomic cations, M⁺, that lie within the thermodn. window for O-atom transport **catalysis** of the oxidation of hydrogen by nitrous oxide, have been checked for **catalytic** activity at room temperature with kinetic measurements using an inductively-coupled plasma/selected-ion flow tube (ICP/SIFT) tandem mass spectrometer. Only 4 of these 25 atomic cations were seen to be **catalytic**: Fe⁺, Os⁺, Ir⁺, and Pt⁺. Two of these, Ir⁺ and Pt⁺, are efficient **catalysts**, while Fe⁺ and Os⁺ are not. Eighteen atomic cations (Cr⁺, Mn⁺, Co⁺, Ni⁺, Cu⁺, Ge⁺, Se⁺, Mo⁺, Ru⁺, Rh⁺, Sn⁺, Te⁺, Re⁺, Pb⁺, Bi⁺, Eu⁺, Tm⁺, and Yb⁺) react too slowly at room temperature either in their oxidation with N₂O to form MO⁺ or in the reduction of MO⁺ by H₂. Many of these reactions are known to be spin forbidden and a few actually may lie outside the thermodn. window. Three alkaline-earth metal monoxide cations, CaO⁺, SrO⁺, and BaO⁺, were observed to favor MOH⁺ formation in their reactions with H₂. A potential-energy landscape is computed for the oxidation of H₂ with N₂O **catalyzed** by Fe^{+(6D)} that vividly illustrates the operation of an ionic **catalyst** and qual. accounts for the relative inefficiency of this **catalyst**.
 CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 Section cross-reference(s): 65, 73
 ST **catalytic** oxidn hydrogen nitrous oxide gas phase; oxygen atom transport atomic metal cation
 IT Density functional theory
 (B3LYP; **catalytic** oxidation of H₂ by N₂O in gas phase and O-atom transport with atomic metal cations)
 IT Electronic state
 Energy

Enthalpy
 Free energy
 Ion-molecule reaction
 Oxidation **catalysts**
 Potential energy surface
 Zero point energy
 (catalytic oxidation of H₂ by N₂O in gas phase and O-atom
 transport with atomic metal cations)
 IT Alkaline earth oxides
 RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
 (catalytic oxidation of H₂ by N₂O in gas phase and O-atom
 transport with atomic metal cations)
 IT Oxidation
 (catalytic; catalytic oxidation of H₂ by N₂O in
 gas phase and O-atom transport with atomic metal cations)
 IT Transition metals, uses
 RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
 (ions; catalytic oxidation of H₂ by N₂O in gas phase and
 O-atom transport with atomic metal cations)
 IT 14067-02-8, Iron(1+), uses 14067-03-9, Chromium(1+),
 uses 14127-69-6, Manganese(1+), uses 14701-24-7, Selenium(1+),
 uses 14701-27-0, Lead(1+), uses 14903-34-5, Nickel
 (1+), uses 15065-79-9, Europium(1+), uses 15184-93-7,
 Thulium(1+), uses 15888-69-4, Germanium(1+), uses 16463-30-2,
 Bismuth(1+), uses 16610-75-6, Cobalt(1+), uses 16727-12-1,
 Molybdenum(1+), uses 17493-86-6, Copper(1+), uses 20019-76-5,
 Ruthenium(1+), uses 20205-78-1, Ytterbium(1+), uses 20561-52-8,
 Osmium(1+), uses 20561-56-2, Platinum(1+),
 uses 20561-58-4, Rhenium(1+), uses 20561-59-5, Rhodium(1+), uses
 21474-65-7, Tellurium(1+), uses 26288-30-2, Tin(1+), uses
 51403-88-4 54923-08-9, Iridium(1+), uses 55964-52-8 83018-04-6
 RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
 (catalytic oxidation of H₂ by N₂O in gas phase and O-atom
 transport with atomic metal cations)
 IT 1333-74-0, Hydrogen, reactions 10024-97-2, Nitrous oxide,
 reactions 17778-80-2, Oxygen atom, reactions
 RL: PEP (Physical, engineering or chemical process); PRP
 (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or
 reagent)
 (catalytic oxidation of H₂ by N₂O in gas phase and O-atom
 transport with atomic metal cations)

OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)
 RE.CNT 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 5 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
 AN 2007:618606 HCAPLUS Full-text
 DN 147:12976
 TI Stable electrodes having metal-doped nonstoichiometric titania intermediate layers between electrocatalyst layers and nanostructured supports and polymer electrolyte fuel cells equipped therewith
 IN Miyazaki, Kazuya
 PA Canon Inc., Japan
 SO Jpn. Kokai Tokkyo Koho, 10pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2007141626	A	20070607	JP 2005-333240	20051117

PRAI JP 2005-333240 20051117
 AB The electrodes comprise **catalysts**, nanostructured supports, and nonstoichiometric titanium oxide intermediate layers doped with Pt, Al, Si, V, Cr, Fe, Co, Ni, Cu, Zn, Ge, Zr, Nb, Mo, Ru, Rh, Pd, Ag, In, Sn, Hf, Ta, W, Os, Ir, Au, La, Ce, and/or Nd. Thus, Magneli-phase titanium oxide layer and Pt-Pd (Pd 60 atomic%) **catalyst** layer were successively formed on graphite nanofiber layer (grown on quartz substrate) and treated under 10 kPa H at 600° for 10 min, in order to accelerate Pt-Pd alloying, size reduction, and dissoln. into the titanium oxide layer, to give electrode film.
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 67, 72
 IT **Catalysts**
 (electrocatalysts; stable PEFC electrodes having metal-doped nonstoichiometric titania intermediate layers between electrocatalyst layers and nanostructured supports)
 IT 12720-14-8, Palladium 60, platinum 40 (atomic) 39305-53-8, Cobalt 50, platinum 50 (atomic)
 RL: CAT (Catalyst use); USES (Uses)
 (electrocatalysts; stable PEFC electrodes having metal-doped nonstoichiometric titania intermediate layers between electrocatalyst layers and nanostructured supports)

IT 7429-90-5, Aluminum, uses 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses 7439-98-7, Molybdenum, uses 7440-00-8, Neodymium, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-25-7, Tantalum, uses 7440-31-5, Tin, uses 7440-33-7, Tungsten, uses 7440-45-1, Cerium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-56-4, Germanium, uses 7440-57-5, Gold, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7440-74-6, Indium, uses
 RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
 (titanium oxide intermediate layers doped with; stable PEFC electrodes having metal-doped nonstoichiometric titania intermediate layers between electrocatalyst layers and nanostructured supports)

OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L122 ANSWER 6 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
 AN 2007:427983 HCAPLUS Full-text
 DN 147:59864
 TI Oxygen Reduction Activity of Carbon-Supported Pt-M (M = V, Ni, Cr, Co, and Fe) Alloys Prepared by Nanocapsule Method
 AU Yano, Hiroshi; Kataoka, Mikihiro; Yamashita, Hisao; Uchida, Hiroyuki; Watanabe, Masahiro
 CS Clean Energy Research Center, University of Yamanashi, Takeda 4, Kofu, 400-8510, Japan
 SO Langmuir (2007), 23(11), 6438-6445
 CODEN: LANGD5; ISSN: 0743-7463
 PB American Chemical Society
 DT Journal
 LA English
 AB Monodispersed Pt and Pt-M (M = V, Cr, Fe, Co, and Ni) alloy nanoparticles supported on C black (denoted as Pt/CB and Pt-M/CB) were prepared by the simultaneous reduction of Pt acetylacetone and the 2nd metal acetylacetone within nanocapsules formed in di-Ph ether in the presence of C black. For the Pt/CBs, the average Pt diams. measured by scanning TEM (STEM) or XRD ranged from 2.0 to 2.5 nm, regardless of the catalyst-loading level from 10 to 55% on CB. The alloy composition is well-controlled to the projected value among the supported particles. The activities for the oxygen reduction reaction (ORR) at Nafion-coated catalysts in O₂-saturated 0.1M HClO₄ solution were evaluated by using a channel flow electrode (CFE) cell at 30°. The area-specific ORR activities at Pt-M/CB are 1.3 to 1.8

times higher than that at Pt/CB. The ORR activity increased in the order Pt/CB < Pt-Ni/CB < Pt-Fe/CB < Pt-Co/CB < Pt-V/CB < Pt-Cr/CB.

CC 72-2 (Electrochemistry)
IT Section cross-reference(s): 52, 56, 67, 78
IT Reduction catalysts
(electrochem.; Pt alloys supported on carbon black for oxygen)
IT Capsules
(nanocapsules; reduction of bis(acetylacetonato)platinum with chromium and vanadium and iron-group acetylacetones in nanocapsules formed in di-Ph ether in presence of carbon black for Pt alloy electrocatalysts for oxygen reduction)
IT Reduction
(of bis(acetylacetonato)platinum with chromium and vanadium and iron-group acetylacetones in nanocapsules formed in di-Ph ether in presence of carbon black for Pt alloy electrocatalysts for oxygen reduction)
IT Carbon black, uses
RL: CAT (Catalyst use); USES (Uses)
(reduction of bis(acetylacetonato)platinum with chromium and vanadium and iron-group acetylacetones in nanocapsules formed in di-Ph ether in presence of carbon black for Pt alloy electrocatalysts for oxygen reduction)
IT 100471-45-2P, Iron 40.6, platinum 59.4 (atomic)
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(electrocatalysts prepared by ethylene glycol reduction method and supported on carbon black for oxygen reduction and comparison with alloy prepared by nanocapsule method)
IT 11123-71-0P, Iron 56.6, platinum 43.4 (atomic)
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(electrocatalysts prepared by nanocapsule method and supported on carbon black for oxygen reduction)
IT 37274-26-3P, Iron 50, platinum 50 (atomic) 56712-62-0P, Cobalt 54, platinum 46 (atomic) 940861-90-5P, Platinum 53, vanadium 47 (atomic) 940861-91-6P, Chromium 51, platinum 49 (atomic)
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(oxygen reduction activity of carbon-supported Pt alloy electrocatalysts prepared by nanocapsule method by reduction of acetylacetones)
IT 7440-06-4P, Platinum, uses 53590-11-7P, Nickel 45,

platinum 55 (atomic)

RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)

(oxygen reduction activity of carbon-supported Pt and Pt alloy electrocatalysts prepared by nanocapsule method by reduction of acetylacetones)

IT 3264-82-2, Bis(acetylacetonato)nickel 13476-99-8,

Tris(acetylacetonato)vanadium 14024-18-1,

Tris(acetylacetonato)iron 21679-31-2, Tris(acetylacetonato)chromium 21679-46-9, Tris(acetylacetonato)cobalt

RL: RCT (Reactant); RACT (Reactant or reagent)

(simultaneous reduction with bis(acetylacetonato)platinum in nanocapsules formed in di-Ph ether in presence of carbon black for Pt alloy electrocatalysts for oxygen reduction)

IT 15170-57-7, Bis(acetylacetonato)platinum

RL: RCT (Reactant); RACT (Reactant or reagent)

(simultaneous reduction with **chromium** and vanadium and iron-group acetylacetones in nanocapsules formed in di-Ph ether in presence of carbon black for Pt alloy electrocatalysts for oxygen reduction)

OSC.G 16 THERE ARE 16 CAPLUS RECORDS THAT CITE THIS RECORD (16 CITINGS)

RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 7 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2007:214859 HCAPLUS Full-text

DN 146:340995

TI Method for manufacturing proton-conductive fuel cell catalyst composed of high polymer modified nanoscale noble metal colloid

IN Mu, Shichun; Cheng, Niancai; Pan, Mu; Yuan, Runzhang

PA Wuhan University of Technology, Peop. Rep. China

SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 8pp.

CODEN: CNXXEV

DT Patent

LA Chinese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1917260	A	20070221	CN 2006-10020004	20060817
	CN 100399612	C	20080702		
PRAI	CN 2006-10020004		20060817		

AB The title method comprises: (1) preparing proton-conductive high polymer modified nanoscale noble metal colloid with particle size of 2-5 nm, and (2) depositing on a carbon carrier (nanoscale carbon black, nanoscale graphite balls with particle size of 10-100 nm or mesoporous carbon microballs with particle size of 2-50 nm). The high polymer in step 1 is one of perfluorosulfonic acid resin, sulfonated polysulfone resin, sulfonated polybenzimidazole, sulfonated polyphenylenesulfide resin, sulfonated polyphosphazene, sulfonated polyimide resin, sulfonated polystyrene resin and sulfonated polyetheretherketone resin. The introduction of proton-conductive high polymer can increase the steric hindrance of noble metal microparticles that can anchor on the carrier. In addition, proton-conductive high polymer can increase the bonding force between the noble metal microparticles and the carrier. The obtained **catalyst** is processed into fuel cell chip **catalyst** coated membrane (CCM), and assembled into single cell to improve the elec. output performance.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 35, 67, 76

ST proton conductive fuel cell **catalyst** polymer nanoparticle chip

IT Integrated circuits
Microspheres
Nanoparticles
(method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Carbon black, uses
RL: CAT (Catalyst use); USES (Uses)
(method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Sulfonic acids, uses
RL: CAT (Catalyst use); USES (Uses)
(perfluoro; method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Polyketones
RL: CAT (Catalyst use); USES (Uses)
(polyether-, sulfonated; method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Polyethers, uses
RL: CAT (Catalyst use); USES (Uses)

(polyketone-, sulfonated; method for manufacturing proton-conductive

fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Fuel cells

(proton exchange membrane; method for manufacturing proton-conductive

fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Polybenzimidazoles

Polyimides, uses

Polyphosphazenes

Polysulfones, uses

Polythiophenylenes

RL: CAT (Catalyst use); USES (Uses)

(sulfonated; method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Perfluoro compounds

RL: CAT (Catalyst use); USES (Uses)

(sulfonic acids; method for manufacturing proton-conductive fuel cell

cell

catalyst composed of high polymer modified nanoscale noble metal colloid)

IT Platinum alloy, base

RL: CAT (Catalyst use); USES (Uses)

(method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-96-5,

Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0,

Nickel, uses 7440-04-2, Osmium, uses 7440-05-3,

Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-31-5, Tin, uses

7440-32-6, Titanium, uses 7440-44-0, Carbon, uses 7440-47-3,

Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8,

Copper, uses 7440-55-3, Gallium, uses 7440-62-2, Vanadium, uses

7782-42-5, Graphite, uses 9003-53-6D, Polystyrene, sulfonated

31694-16-3D, sulfonated 63627-81-6, **Platinum 70,**

ruthenium 30 (atomic) 929088-22-2,

Chromium 10, platinum 70, ruthenium 20 (atomic)

RL: CAT (Catalyst use); USES (Uses)

(method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT 56-81-5, Glycerol, uses 64-17-5, Ethanol, uses 67-56-1,

Methanol, uses 67-63-0, Isopropanol, uses 71-23-8, Propanol,

uses 107-21-1, Ethylene glycol, uses 25265-75-2, Butanediol

RL: NUU (Other use, unclassified); USES (Uses)
 (method for manufacturing proton-conductive fuel cell **catalyst**
 composed of high polymer modified nanoscale noble metal colloid)

IT 10025-73-7, Chromium trichloride 10049-08-8, Ruthenium
 trichloride 16941-12-1, Chloroplatinic acid
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (method for manufacturing proton-conductive fuel cell **catalyst**
 composed of high polymer modified nanoscale noble metal colloid)

IT 1310-73-2, Sodium hydroxide, reactions
 RL: RGT (Reagent); RACT (Reactant or reagent)
 (method for manufacturing proton-conductive fuel cell **catalyst**
 composed of high polymer modified nanoscale noble metal colloid)

IT 7440-57-5, Gold, uses 9002-84-0, Polytetrafluoroethylene
 12597-68-1, Stainless steel, uses 359816-85-6, Nafion NRE 211
 RL: TEM (Technical or engineered material use); USES (Uses)
 (method for manufacturing proton-conductive fuel cell **catalyst**
 composed of high polymer modified nanoscale noble metal colloid)

L122 ANSWER 8 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
 AN 2006:870046 HCAPLUS Full-text
 DN 145:427834
 TI Electro-oxidation of dimethyl ether on Pt/C and PtMe/C
catalysts in sulfuric acid
 AU Liu, Yan; Mitsushima, Shigenori; Ota, Ken-Ichiro; Kamiya, Nobuyuki
 CS Chemical Energy Laboratory, Yokohama National University,
 Yokohama-shi, 240-8501, Japan
 SO Electrochimica Acta (2006), 51(28), 6503-6509
 CODEN: ELCAAV; ISSN: 0013-4686
 PB Elsevier B.V.
 DT Journal
 LA English
 AB The electrooxidn. of di-Me ether (DME) on PtMe/C (Me = Ru, Sn, Mo,
 Cr, Ni, Co, and W) and Pt/C electro-**catalysts** were studied in an
 aqueous half-cell, and compared to the MeOH oxidation. The addition
 of a 2nd metal enhanced the tolerance of Pt to the poisonous species
 during the DME oxidation reaction (DOR). The PtRu/C electro-
catalyst showed the best electro-**catalytic** activity and the highest
 tolerance to the poisonous species in the low over-potential range
 (<0.55 V, 50°) among the binary electro-**catalysts** and the Pt/C, but
 at the higher potential (>ca. 0.55 V, 50°), the Pt/C behaved better
 than PtRu/C. The apparent activation energy for the DOR decreased in
 the order: PtRu/C (57 kJ mol-1) > Pt3Sn/C (48 kJ mol-1) ≈ Pt/C (46 kJ
 mol-1). However, the activation energy for the MOR showed a
 different turn, decreased in the following order: Pt/C (43 kJ mol-1)
 > Pt3Sn/C (35 kJ mol-1) ≈ PtRu/C (34 kJ mol-1). The temperature
 dependence of the DOR was greater than that of the oxidation of MeOH
 (MOR) on the PtRu/C.

CC 72-2 (Electrochemistry)
 Section cross-reference(s): 22, 52, 66, 67
 ST electrooxidn dimethyl ether carbon supported platinum
 catalyst sulfuric acid; alloy binary platinum carbon
 supported catalyst dimethyl ether electrooxidn
 IT Surface area
 (carbon-supported Pt and Pt alloys for di-Me ether electrochem.
 oxidation catalysts)
 IT Oxidation catalysts
 (electrochem.; carbon-supported Pt and Pt alloys for di-Me ether)
 IT 7440-06-4, Platinum, uses 12714-36-2, Platinum 50, ruthenium 50
 (atomic) 37256-04-5, Nickel 50, platinum 50 (atomic)
 37365-44-9, platinum 75, tin 25 (atomic
) 39305-53-8, Cobalt 50, platinum 50 (atomic) 77622-66-3,
 Platinum 50, tungsten 50 (atomic) 110669-45-9, Chromium
 33.3, platinum 66.7 (atomic)
 190711-69-4, Molybdenum 25, platinum 75 (atomic)
 RL: CAT (Catalyst use); USES (Uses)
 (carbon-supported catalysts; di-Me ether electrochem.
 oxidation in sulfuric acid solution on)
 OSC.G 10 THERE ARE 10 CAPLUS RECORDS THAT CITE THIS RECORD (10
 CITINGS)
 RE.CNT 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 9 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
 AN 2006:839187 HCAPLUS Full-text
 DN 145:441246
 TI Alloy Electrocatalysts
 AU He, T.; Kreidler, E.; Xiong, L.; Luo, J.; Zhong, C. J.
 CS Honda Research Institute USA, Incorporated, Columbus, OH, 43212, USA
 SO Journal of the Electrochemical Society (2006), 153(9), A1637-A1643
 CODEN: JESOAN; ISSN: 0013-4651
 PB Electrochemical Society
 DT Journal
 LA English
 AB Improving efficiency and reducing overall cost are necessary for the commercialization of fuel cell-powered vehicles. Electrocatalysts play an important role, particularly in the cathode, where the O reduction reaction is sluggish and the noble metal loading is relatively high. To discover less expensive and more active cathode catalysts, a novel combinatorial workflow was developed to study alloy-based electrocatalysts. In addition to the discovery program, various synthesis technologies were studied and developed to engineer nanoscale catalyst particles with controllable size, monodispersity, and microcomposition. These research activities are reported with a

focus on the activity-stability-composition relation for Pt-based metal alloys.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 67

IT Fuel cell cathodes
(**catalytic**; alloy electrocatalysts for fuel cell cathodes)

IT **Catalysts**
(electrocatalysts; alloy electrocatalysts for fuel cell cathodes)

IT Reduction **catalysts**
(electrochem.; alloy electrocatalysts for fuel cell cathodes)
IT 39349-60-5 39349-61-6 39349-62-7 39349-63-8 39441-85-5
39454-05-2 51399-11-2 51403-08-8 53071-52-6 55777-15-6
60952-32-1 76931-28-7 77506-59-3, **Chromium** 50,
platinum 50 (atomic) 122912-04-3, Platinum base, selenium
141020-73-7 154635-81-1, Iron, **nickel**, platinum base
162163-00-0 178986-30-6, Molybdenum, platinum base 912807-59-1,
Chromium 64, **platinum** 36 (atomic
) 912807-61-5, Iron, platinum base, vanadium
RL: CAT (Catalyst use); DEV (Device component use); PRP
(Properties); USES (Uses)
(alloy electrocatalysts for fuel cell cathodes)

OSC.G 28 THERE ARE 28 CAPLUS RECORDS THAT CITE THIS RECORD (28 CITINGS)

RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 10 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2005:172023 HCAPLUS Full-text

DN 142:226555

TI O-Atom Transport **Catalysis** by Atomic Cations in the Gas Phase: Reduction of N₂O by CO

AU Blagojevic, Voislav; Orlova, Galina; Bohme, Diethard K.

CS Department of Chemistry, Centre for Research in Mass Spectrometry and Centre for Research in Earth and Space Science, York University, Toronto, ON, M3J 1P3, Can.

SO Journal of the American Chemical Society (2005), 127(10), 3545-3555
CODEN: JACSAT; ISSN: 0002-7863

PB American Chemical Society

DT Journal

LA English

AB Atomic cations (26), M+, have been shown to lie within a thermodn. window for O-atom transport **catalysis** of the reduction of N₂O by CO and have been checked for **catalytic** activity at room temperature with kinetic measurements using an inductively-coupled plasma/selected-ion flow tube (ICP/SIFT) tandem mass spectrometer. Only 10 of these 26 atomic cations were seen to be **catalytic**: Ca+, Fe+, Ge+, Sr+, Ba+,

Os+, Ir+, Pt+, Eu+, and Yb+. The remaining 16 cations that lie in the thermodn. window (Cr+, Mn+, Co+, Ni+, Cu+, Se+, Mo+, Ru+, Rh+, Sn+, Te+, Re+, Pb+, Bi+, Tm+, and Lu+) react too slowly at room temperature either in the formation of MO+ or in its reduction by CO. Many of these reactions are known to be spin forbidden and a few actually may lie outside the thermodn. window. A new measure of efficiency is introduced for catalytic cycles that allows the discrimination between catalytic cations on the basis of the efficiencies of the two legs of the catalytic cycle. Also, a potential-energy landscape is computed for the reduction of N₂O by CO catalyzed by Fe+(6D) that vividly illustrates the operation of an ionic catalyst .

CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)

Section cross-reference(s): 59, 73

ST oxygen atom transport catalysis metal cation gas phase; redn nitrogen carbon oxide gas phase catalysis metal cation

IT Cations

(O-atom transport catalysis by atomic cations in gas phase and reduction of NO by CO)

IT Electronic state

Potential energy surface

Reduction catalysts

Reduction enthalpy

Reduction kinetics

(O-atom transport catalysis by atomic cations in gas phase and reduction of N₂O by CO)

IT Rare earth metals, uses

Transition metals, uses

RL: CAT (Catalyst use); PRP (Properties); USES (Uses)

(ions; O-atom transport catalysis by atomic cations in gas phase and reduction of N₂O by CO)

IT 14067-02-8, Iron(1+), uses 14067-03-9, Chromium(1+), uses 14102-48-8, Calcium(1+), uses 14127-69-6, Manganese(1+), uses 14701-18-9, Strontium(1+), uses 14701-24-7, Selenium(1+), uses 14701-27-0, Lead(1+), uses 14903-34-5, Nickel(1+), uses 15065-79-9, Europium(1+), uses 15184-93-7, Thulium(1+), uses 15888-69-4, Germanium(1+), uses 16463-30-2, Bismuth(1+), uses 16541-35-8, Barium(1+), uses 16610-75-6, Cobalt(1+), uses 16727-12-1, Molybdenum(1+), uses 16887-05-1, Lutetium(1+), uses 17493-86-6, Copper (1+), uses 20019-76-5, Ruthenium(1+), uses 20205-78-1, Ytterbium(1+), uses 20561-52-8, Osmium (1+), uses 20561-56-2, Platinum(1+), uses 20561-58-4, Rhenium(1+), uses 20561-59-5, Rhodium(1+), uses 21474-65-7, Tellurium(1+), uses 26288-30-2, Tin(1+), uses 54923-08-9, Iridium(1+), uses

RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
 (O-atom transport **catalysis** by atomic cations in
 gas phase and reduction of N₂O by CO)

IT 17778-80-2, Oxygen atom, processes
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical
 process); PROC (Process)
 (O-atom transport **catalysis** by atomic cations in gas phase
 and reduction of N₂O by CO)

IT 630-08-0, Carbon monoxide, reactions 10024-97-2, Nitrous oxide,
 reactions
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical
 process); PRP (Properties); RCT (Reactant); PROC (Process); RACT
 (Reactant or reagent)
 (O-atom transport **catalysis** by atomic cations in gas phase
 and reduction of N₂O by CO)

OSC.G 27 THERE ARE 27 CAPLUS RECORDS THAT CITE THIS RECORD (27
 CITINGS)

RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 11 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2003:222203 HCAPLUS Full-text

DN 138:224245

TI Process for producing electrode **catalyst** for fuel cell

IN Hiroshima, Kazutaka; Asaoka, Takahiko; Ohya, Yutaka; Noritake,
 Tatsuo; Kato, Hisao; Nagami, Tetsuo

PA Toyota Jidosha Kabushiki Kaisha, Japan

SO U.S. Pat. Appl. Publ., 9 pp.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 20030054227	A1	20030320	US 2002-228338	200208 27
	US 6911278	B2	20050628		
	JP 2003092114	A	20030328	JP 2001-282075	200109 17
	CA 2402183	A1	20030317	CA 2002-2402183	200209 10
	CA 2402183	C	20080408		
	DE 10242911	A1	20030410	DE 2002-10242911	

PRAI JP 2001-282075

A 20010917

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB An electrode **catalyst** for a fuel cell includes a conductive support, and **catalytic** particles loaded on the conductive support. The **catalytic** particles include platinum and a base metal being on the lower end of the electrochem. series with respect to platinum. The number of the atoms of the base metal, forming metallic oxides without alloying with the **platinum**, is less than 5 atomic% of the number of the atoms of the platinum on a surface of the **catalytic** particles. The electrode **catalyst** is produced by loading the platinum and base metal on the conductive support, alloying the platinum and base metal thereon by a heat treatment, thereby making the **catalytic** particles, and removing metallic oxides from a surface of the **catalytic** particles. The electrode **catalyst** is less expensive comparatively, exhibits high **catalytic** activities, and hardly lowers the battery performance of fuel cells.

IC ICM H01M004-88
ICS H01M004-92

INCL 429044000; 502101000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 67

ST electrode **catalyst** prepn fuel cell

IT **Catalysts**
(electrocatalysts; process for producing electrode **catalyst** for fuel cell)

IT Polyoxyalkylenes, uses
RL: MOA (Modifier or additive use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; process for producing electrode **catalyst** for fuel cell)

IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; process for producing electrode **catalyst** for fuel cell)

IT Ionomers
RL: MOA (Modifier or additive use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; process for producing electrode **catalyst** for fuel cell)

IT Alloying
Fuel cell electrodes
Heat treatment
(process for producing electrode **catalyst** for fuel cell)

IT Carbon black, uses
Carbonaceous materials (technological products)

RL: CAT (Catalyst use); TEM (Technical or engineered material use);
 USES (Uses)
 (process for producing electrode **catalyst** for fuel
 cell)

IT Fuel cells
 (solid electrolyte; process for producing electrode
catalyst for fuel cell)

IT 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7439-98-7,
 Molybdenum, uses 7440-02-0, Nickel, uses 7440-06-4,
 Platinum, uses 7440-47-3, Chromium, uses 7440-48-4,
 Cobalt, uses 7440-62-2, Vanadium, uses 39339-47-4
 RL: CAT (Catalyst use); USES (Uses)
 (process for producing electrode **catalyst** for fuel
 cell)

IT 12325-31-4, DiSodium Hexahydroxyplatinate 127796-19-4, Platinum
 sulfite
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical
 process); PROC (Process)
 (process for producing electrode **catalyst** for fuel
 cell)

IT 7664-93-9, Sulfuric acid, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (process for producing electrode **catalyst** for fuel
 cell)

OSC.G 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD (12
 CITINGS)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 12 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
 AN 1987:563892 HCAPLUS Full-text
 DN 107:163892
 OREF 107:26200h,26201a
 TI Electrocatalysis of the hydrogen oxidation and of the oxygen
 reduction reactions on platinum and some alloys in alkaline medium
 AU Couturier, G.; Kirk, D. W.; Hyde, P. J.; Srinivasan, S.
 CS Dep. Chem. Eng., Univ. Toronto, Toronto, ON, M5S 1A4, Can.
 SO Electrochimica Acta (1987), 32(7), 995-1005
 CODEN: ELCAAV; ISSN: 0013-4686
 DT Journal
 LA English
 AB The objectives of the present study were to find substitutes for Pt
 as electrocatalysts for alkaline fuel cells. For this purpose,
 electrode kinetic studies were carried out for the H oxidation
 reaction on the metals Pt and Ni, and on the alloys Pt-Ni, Pt-Ti and
 Ni-Ti and for the O reduction on Pt and the alloys Pt-Cr, Pt-Ta and
 Pt-Cr-Ta. For economic reasons, the electrodes were in the form of

sputtered films on glass disks which could be mounted on the shaft of a rotating disk electrode apparatus. The rotating disk electrode expts. were conducted in 1N KOH at 23-70°. The cyclic voltammetric technique was used to characterize the electrodes in the potential range of interest for fuel cell reactions. Analyses of the surface and bulk comps. of the alloys were made using Auger electron spectroscopy, electron spectroscopy by chemical anal. or energy dispersive x-ray techniques. Although for the H oxidation reactions Pt was the best electrocatalyst, Ni and Pt-Ti could be considered as potential substitutes. The results for Pt substitution were more encouraging for the O reduction reaction. The alloy Pt-Cr-Ta showed a considerably better performance than did Pt. This alloy displayed a single Tafel slope (45 mV/decade) at 55 and 70°, while 2 Tafel slopes were observed for all other electrodes. The Pt-Ta alloy also exhibited a better electrode kinetic behavior and like Pt-Cr-Ta is a potential substitute for Pt for this reaction.

CC 72-2 (Electrochemistry)
 Section cross-reference(s): 52, 67

ST hydrogen oxidn electrochem electrocatalyst; oxygen redn electrochem electrocatalyst; kinetics hydrogen electrooxidn oxygen electroredn; electrooxidn kinetics hydrogen catalyst; electroredn kinetics oxygen platinum alloy; platinum alloy electrocatalyst hydrogen oxygen; nickel electrocatalyst hydrogen oxidn

IT Oxidation, electrochemical
 (of hydrogen on nickel and platinum and their alloys in alkaline solution)

IT Oxidation catalysts
 (electrochem., nickel and platinum and sputtered platinum-nickel alloys, for hydrogen in alkaline solution)

IT Kinetics of oxidation
 (electrochem., of hydrogen on nickel and platinum and sputtered platinum and nickel alloys in alkaline solution)

IT Reduction catalysts
 (electrochem., platinum and sputtered platinum alloys, for oxygen in alkaline solns.)

IT Electric current
 (exchange, in hydrogen oxidation on nickel and platinum and their alloys and oxygen reduction on platinum and its alloys in alkaline solution)

IT Electrodes
 (fuel-cell, catalytic, platinum and nickel and their alloys)

IT 7440-02-0, Nickel, uses and miscellaneous
 RL: USES (Uses)
 (electrocatalyst, for hydrogen oxidation in alkaline solution)

IT 12683-48-6 67055-25-8, Nickel 40, platinum 60 (atomic)

110669-44-8, Platinum 66, titanium 34 (atomic)

RL: PRP (Properties)

(hydrogen electrochem. evolution kinetics on, in alkaline solution,

electrocatalyst in relation to)

IT 1333-74-0, Hydrogen, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(oxidation of, electrochem., on platinum and sputtered platinum alloys and nickel-titanium alloys, in alkaline solns., electrocatalyst in relation to)

IT 110669-45-9, Chromium 34, platinum 66 (atomic)

110669-46-0, Platinum 66, tantalum 34 (atomic)

110669-47-1, Chromium 20, platinum 66, tantalum 14 (atomic)

RL: PRP (Properties)

(oxygen electroredn. kinetics on, in alkaline solution, electrocatalyst in relation to)

OSC.G 13 THERE ARE 13 CAPLUS RECORDS THAT CITE THIS RECORD (13 CITINGS)

=>